

SELF-REGULATED LEARNING AND WELL-BEING IN MAINSTREAM CLASSROOMS: FOCUSING THE LENS ON STUDENTS WITH LEARNING DISABILITY

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ABSTRACT

Research investigation in both general as well as special education has recently developed a lot of focus around self-regulation, generally and self-regulated learning, in particular. Research has informed us and provided evidence that for teaching struggling learners, students facing learning issues and students with learning disabilities, self-regulated strategies have proved to be a promising approach. This paper attempts to throw light on Self-Regulated Strategy as a sustainable intervention strategy for students' with learning disability. The discussion in the paper is based on the 'Self-Regulated Strategy Development' model of self-regulation. The intervention package was based on reading and writing strategies provided through the self-regulated strategies development model. The intervention provided is comprised of a package of thirty interventions. The first ten focused on reading strategies, while the remaining were writing strategies. The entire package covered a whole range of reading and writing strategies, starting from basic reading strategies to editing and revising strategies. The paper also tries to sketch a relationship between self-regulated strategy and self-efficacy, with special reference to students' with learning disability. Similarly, a link has also been drawn between self-regulated strategy and well-being with special reference to students' with learning disability.

KEYWORDS: Self-regulated Strategy, Well-being, Intervention & Learning Disability

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INTRODUCTION

The children today of any country are going to be its future citizens, who will be the pillars in shaping the destiny of the nation in the years to come. This makes it our prime duty to focus on these young pillars and help them build a strong foundation. It is now an established fact that every individual is unique. It is this uniqueness that explains the varying needs, capabilities and circumstances of each child. There might be every possibility that each classroom has children with different strengths and weaknesses. Every learner has his unique patterns of learning and acquiring knowledge. There are some students who may come to school regularly, but they are likely to drop out if their needs are not adequately met. The fact that learning disabled students have near normal, normal or above normal intelligence envisages that these students should be identified as early as possible, so that, required intervention strategies can be planned at the earliest for them.

The 'Millennium Development Goals' (MDGs) have very gradually and progressively given way to the 'Sustainable Development Goals' (SDGs) which were adopted in 2015, and have set targets that would be aspired to be achieved by 2030. Each of the Sustainable Development Goals should not be looked at independently, as

each and every goal is deeply interwoven, intertwined with every other. The recognition of interdependencies, trade-offs and synergy among the various goals, and their integration into policy design, is recognized as critical for moving forward towards sustainable development (UN, 2015b).

The concept of self-regulation is the overarching, broader concept from which, the various others related to it have been derived. Self-regulation is needed in most areas of human behaviour, and only if we nurture this concept, will we have people who have belief in their capabilities to bring about a change in their own lives as well as that of others. In the case of the learning disabled, this assumes even greater importance as repeated failure at school, reprimand from teachers and parents, deficit in social skills to explain their problem has a detrimental effect on their feelings of self-efficacy. This also hinders and diminishes their feeling of general well-being.

The term 'well-being' is indeed complex and there is yet little conceptual clarity with regard to it. One reason is that, different researchers use different definitions and at times use terms interchangeably. The ways in which this term is measured is also equally diverse and varied. Another interesting aspect is that, in the Indian scenario, we yet do not give importance to well-being during the years at school.

Convention on Rights of Persons with Disabilities

The Convention on Rights of Persons with Disabilities (CRPD) states that "persons with disabilities include those, who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others".

The children with disabilities are discussed and dealt with in article 7 of the convention. It states that parties are required to act in accordance with the principle of the best interests of the child, and to ensure the rights of children with disabilities on an equal basis and the right of the child to express his/her views freely on all matters affecting them.

The article 24 of the convention delineates on the rights of persons with disabilities to education. It must be highlighted that the article makes a call for an inclusive education system at all levels and life-long learning. For instance, below is quoted clause 1 (b), "The development by persons with disabilities of their personality, talents and creativity, as well as their mental and physical abilities, to their fullest potential". Let us now quote clause 2 (e), "Effective individualized support measures are provided in environments that maximize academic and social development, consistent with the goal of full inclusion.

The idea of starting with the Convention on Rights of Persons with disabilities is to use a global framework as a starting point that becomes binding on all state parties. The above clauses of the CRPD has focus on development of personality, talents and creativity to their fullest potential along with effective individualized support measures. While, the convention talks across all disabilities, the focus of our discussion would be limited to learning disabilities, where, self-regulated strategy promises to focus on development of personality, talents and creativity.

Learning Disability/ Specific Learning Disorder

Let us first try to understand the meaning of the term 'learning disability' in relation to which, we would be discussing self-regulated strategy as a sustainable intervention. The narratives and discourse around learning disabilities is not very ancient or old. It is rather a recent discourse that started gaining impetus in the late 1960s and early 1970s. It is still important to highlight that even in the relatively short span to time the definition and scientific understanding about the

condition of learning disability has gained fresher understanding though still being in a state of evolution.

According to National Advisory Committee on Handicapped Children in 1968 (Kirk, 1968):

“Children with special learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or in using spoken or written languages. These may be manifested in disorders of listening, thinking, talking, reading, writing, speaking or arithmetic. They include conditions, which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasia etc. They do not include learning problems that are due primarily to visual, hearing or motor handicaps, to mental retardation, emotional disturbance or to environmental disadvantage”.

According to the United States Federal Register (1977):

“Specific learning disability means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell or to do mathematical calculation. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia and developmental aphasia. The term does not include children who have learning problem, which are primarily the result of visual, hearing or motor handicaps or mental retardation, of emotional disturbance or of environmental, culturally or economic disadvantage”.

According to the National Joint Committee for Learning Disabilities (NJCLD) in 1981 (Hammill, Leigh, Mc Nutt, & Larsen, 1981):

“Learning disabilities are a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning and mathematical abilities. These disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction. Even though a learning disability may occur concomitantly with other handicapping conditions (such as sensory impairment, mental retardation, social and emotional disturbance) or environmental influences (such as cultural differences, insufficient or inappropriate instruction, psychogenic factors), it is not the result of those conditions or influences”.

According to the Rights of Persons with Disabilities Bill (2014) as introduced in the Rajya Sabha of India:

“Specific learning disabilities means a heterogeneous group of conditions wherein there is a deficit in processing language, spoken or written, that may manifest itself as a difficulty to comprehend, speak, read, write, spell, or to do mathematical calculations and includes such conditions as perceptual disabilities, dyslexia, dysgraphia, dyscalculia, dyspraxia and developmental aphasia”.

The first point that needs to be brought to the fore and shed light on is the distinction or complementarity between the two seemingly distinct yet similar terms of learning disability and specific learning disorder. Though with most forms of disability, but especially in the case of learning disabilities, at the outset, there is an emphasis on a clinical definition the manifestation of which are however seen in the academic domain.

According to the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013) the term specific learning disorder is defined as:

“A neuro developmental disorder of biological origin manifested in learning difficulty and problems in acquiring

academic skills, markedly below age level and manifested in the early school years, lasting for at least 6 months; not attributed to intellectual disabilities, developmental disorders, or neurological or motor disorders”.

Specific Learning Disorder or SLD is an umbrella term used to describe many different neurological disorders which hamper the child’s abilities to understand, learn or use spoken or written language. Some of the encompassing disorders are:

- Reading disorder
- Mathematical Disorder
- Disorder of written expression
- Visual Processing
- Auditory Processing
- Sensory motor
- Social

Students’ with learning disabilities generally exhibit deficits in attention, memory, attributions which together amount to a feeling or another general characteristic called ‘learned helplessness’. These four characteristics together become a cause and effect to another deficit known as lack of coordinated strategies, which after coming into play sets into motion many other deficits.

Objectives

Self-regulation, self-efficacy and well-being are interwoven concepts, which overlap and cut across each other. The present paper aims to discuss each of the concepts in detail. The specific objectives of this paper are:

- To explain and discuss the concept of self-regulated learning with special reference to students with learning disability.
- To explain and discuss the concept of self-efficacy with special reference to students with learning disability.
- To explain and discuss the concept of well-being with special reference to students with learning disability.

Self Regulation

Let us try to move in a systematic, orderly and step-by-step fashion in order to demystify the concepts of self-regulation, self-regulated learning and self-regulated strategy. It will be that only a small steps and one-by-one approach will help us consolidate our understanding of these similar but subtly different terms.

The concept of self-regulation is the overarching, broader concept from which the various others related to it have been derived. It would be worthwhile to discuss self-regulation first before moving to any of its derivatives. As the science of Psychology has been growing, there has been a growing interest in self-regulation or voluntary action management as it is simply called.

Self-regulation refers to those processes, internal and/or transactional, that enable an individual to guide his/her goal-directed activities over time and across changing circumstances (contexts). Regulation implies modulation of thought,

affect, behaviour, or attention via deliberate or automated use of specific mechanisms and supportive meta skills. The processes of self-regulation are initiated, when routinized activity is impeded or when goal-directedness is otherwise made salient (e.g. the appearance of a challenge, the failure of habitual action patterns, etc.). Self-regulation may be said to encompass up to five interrelated and iterative component phases: 1. goal selection, 2. goal cognition, 3. directional maintenance, 4. directional change or reprioritization, and 5. goal termination (Karoly, 1993)

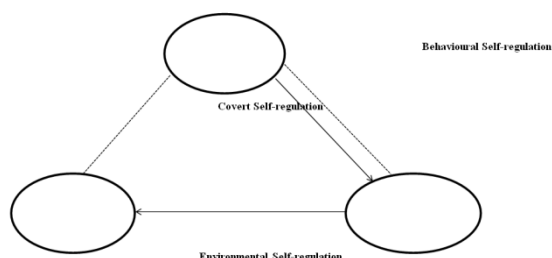


Figure 1

Self-regulated learning assumes reciprocal causation among three influence processes. According to social cognitive theorists, self-regulated learning is not determined merely by personal processes; these processes are assumed to be influenced by environmental and behavioural events, in reciprocal fashion.

Self-regulated Strategy

Research investigations around self-regulation strategies or self-regulated strategies have received major impetus over the last few decades both in the case for students with disabilities as well as other learners. Self-regulated strategy is fast becoming a major area of research both in general and special education.

The discourse and research around self-regulation and application of strategies have been shaped and informed by various theoretical perspectives. This has resulted in the coming up of a number of intervention models of self-regulated learning. One of the earliest models of self-regulation, based on the 'Social Cognitive perspective' is the one developed by Schunk and Zimmerman (1997). In the words of Schunk & Zimmerman (1994), "Self-regulation is a process whereby students activate and sustain cognitions, behaviours and affects, which are systematically oriented towards attainment of their goals". As a matter of fact, it has been theorized by the proponent of the theory himself that students are capable of self-regulating components of their learning behaviours, environment, and internal cognitive and affective processes (Zimmerman, 2000).

Self-regulated Strategies Development (SRSD)

The Self-Regulated Strategy Development (SRSD) model proposed by Harris and Graham is one of the forerunners to all other models of self-regulation. One of the star features of the SRSD model is that, it is theoretically integrative in nature and not based on a single standalone theory. The major underlying premise of SRSD has been the requirement to integrate the multiple lines of research from the multiple theoretical perspectives so as to develop powerful interventions for learners and students facing academic challenges (Harris, 1982). This brings us to a question that, what is the viewpoint or lens through which SRSD model views the learning activity.

It has been documented by (Graham & Harris 2005) that the SRSD approach to strategies views learning as a complex process that relies on changes that occur in the learners' skills, self-regulation, strategic knowledge, domain-specific knowledge and abilities, and motivation. The SRSD model has evolved as a research proven instructional

approach to developing academic and self-regulation strategies Harris, Graham, & Mason, 2003 among students with significant learning difficulties (as cited in Zito, Adkins, Gavins, Harris, & Graham, 2007). So, what makes the SRSD model unique or different from the other strategies instruction models? There are three reasons that chiefly make the SRSD model stand out from the other strategies instruction models.

- The majority of the early models targeted normally achieving students. Also, the development of self-regulation skills was implicitly embedded in intervention as opposed to being developed explicitly (Harris, et al., 2004; Harris & Graham, 1999; Wong et al., 2003). Explicit development of self-regulation strategies was gradually integrated throughout the stages of instruction in the SRSD model (Harris et al., 2003) as research informed that students experiencing learning and academic difficulties require extensive, structured and explicit instruction than their peers to develop skill sets and strategies.
- SRSD directly targets and addresses children's motivation, attitudes and beliefs about themselves as learners, by developing attributions for effort and strategy use including self-efficacy and high levels of engagement.
- The progression or advancement through the various stages of self-regulated strategy development is criterion-based as against being time-based. This works majorly in favour of, who may have been unsuccessful due to a set or a forced pace of instruction.

SRSD and Reading

Reading is one of the core skills in acquiring a language that usually falls just before the final skill of writing. Baumert et al., 2001 state that the major components of reading are word decoding and fluency, reading comprehension is the element that is most tightly linked to the academic and professional success of students' with learning disabilities. Reading comprehension is a complex process, which is the combination of knowledge-and-text-oriented constructions.

In the case of students' with learning disabilities, first and foremost they are unable to recall even the strategies that they may know for reading comprehension, they are also not able to adjust or regulate specific behaviours required for successful comprehension. As reported by Botsas & Padelidu, 2003 students with learning disabilities have deficits in implementing and monitoring effective learning strategies spontaneously. This results in their developing negative or self-depreciative thoughts (Sideridis, 2005; Souvignier, 2003) which in turn further results in low levels of self-efficacy and motivation to read (Guthrie, Wigfield, Metsala, & Cox, 1999; Sideridis, 2003, 2006).

SRSD and Writing

In the order of the acquisition of core skills of a language i.e. listening, speaking, reading and writing; happens to come last. However, writing denotes a higher-order skill and some basic accomplishment with the three skills prior to it. Writing is a goal-directed action, which is entirely directed by the writer from start to finish. Success at writing requires a substantial amount of self-regulation and effort (Graham, Harris, & Troia, 1998). Students facing difficulty or struggling with writing face some particular problems:

- Difficulty in generating ideas and selection of topics
- Do not plan before writing
- Lack strategies for planning, producing, organizing, and revising text

- Even overestimate their abilities to write

By using the SRSD approach, self-regulation is addressed by teaching students how to set goals, self-monitor one's performance, use self-instructions, self-evaluate and self-reinforce. Knowledge of content relevant to writing is improved by teaching relevant information and skills students need to utilize strategies and self-regulation procedures.

Well -Being

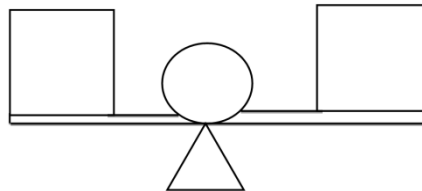


Figure 2

The see-saw represents the drive of an individual to return to a set-point for wellbeing (Brickman and Campbell, 1971; Headey and Wearing 1989, 1991, 1992) as well as the individual's need for equilibrium or homeostasis (Herzlich, 1973; Cummins, 2010). In essence, stable wellbeing is when individuals have the psychological, social and physical resources they need to meet a particular psychological, social and/or physical challenge. When individuals have more challenges than resources, the see-saw dips, along with their wellbeing, and vice-versa.

Research Supporting Self Regulated Learning and Wellbeing in the Classroom

Butler (2003) at the Department of Educational and Counselling Psychology and Special Education, University of British Columbia did a review of research documenting Strategic Content Learning (SCL) efficacy for postsecondary students with learning disabilities. Across the seven studies, SCL was adapted for use in the three most common service delivery models used in colleges and universities. In four studies (n=35), SCL was implemented as a model of individualized tutoring. In another two studies (n=14), SCL served as a model for peer tutor training. The seventh study (n=21) investigated SCL adapted for use within small-group discussions as part of a study skills course.

Analyses of outcome data across the seven studies suggested that, in general, SCL intervention at the post-secondary level is associated with improvement in students' task performance; metacognitive knowledge about tasks, strategies, and self-monitoring; perceptions of self-efficacy. Students developed personalized strategies that addressed their individual needs. They were also observed to take active role in strategy development and to transfer strategic performance across contexts and tasks.

Saddler, Moran, Graham & Harris (2004) at the Department of Educational Psychology, State University of New York and Department of Special Education, University of Maryland conducted a study on the effect of planning strategy instruction on the writing performance of struggling writers. They examined whether early, supplemental strategy in planning helped ameliorate writing difficulties. The study found that learning to use the strategy had a positive effect on writing as students' stories became more complete with the exception of qualitatively better in one student.

Antoniou & Souvignier (2007) at J.W. Goethe University, Frankfurt evaluated in a sample of 73 fifth to eighth graders with learning disabilities (IQ higher than 85 and reading skills below expectation) a reading-strategy program containing reading and self-regulation strategies. The program was taught to the experimental group by their general or special education teachers, whereas the control group received traditional reading instruction. A pre-, post- and follow up

design was used during an entire academic year assessing reading-strategy knowledge, reading comprehension, and reading self-efficacy.

Reading Comprehension: The difference in score change between the pre- and post-tests revealed that, there was a trend for the treatment group to demonstrate greater gain scores than the control group after the program's implementation, $t(71) = 1.72, p < .10$.

Reading Strategy Knowledge: LD students in the treatment group showed a significant improvement in strategy knowledge in the short term, $t(71) = 2.77, p = .007$. This sizeable transfer of strategy knowledge was not evident in the control group, $t(71) = 2.16, p = 0.34$. **Reading Self Efficacy:** The difference in reading self-efficacy between the treatment and control groups' growth scores was not significant between pre- and post-test, $t(71) = .18, p > .10$. Thus, implementation of the program did not seem to influence students' Self efficacy

Dignath, Buettner & Langfeldt (2008) at J.W. Goethe University of Frankfurt, Institute of Educational Psychology conducted a differentiated meta-analysis of 48 treatment comparisons resulting from 30 articles on enhancing self-regulated learning amongst primary school students published between 1992 and 2006. The analysis was based on the literature research carried out in computerized databases such as PsycInfo and ERIC and Psyn dex, the German data base for psychological literature.

Most of the analysed studies reported gains not only in academic performance but also the change of motivational variables. All analyses were conducted once for all outcome measures together, as well as separately for each category. The results of the meta-analysis have shown that self-regulated learning training programmes have a positive effect on learning outcomes, strategy use, and motivation, even for primary children: the analysis based on 263 effect sizes from 48 studies gave a weighted average effect size of .69. This includes the effects on academic performance, cognitive and metacognitive strategy use, as well as motivational aspects. Summarizing the most effective characteristics of interventions yields that a training programme should be based on social-cognitive theories, should train cognitive (especially elaboration and problem solving strategies), metacognitive (especially planning strategies), and motivational strategies (especially feedback), and provide knowledge about strategy use and about its benefits.

Williams (2008) at the Indiana University of Pennsylvania conducted a study on components of self-regulated learning among high school students with learning disabilities. The research addressed the interactions among components of self-regulated learning: self-efficacy, goal orientation, learning strategies, predicative effect of these, grade level and sex on academic achievement on a sample of high school students with learning disabilities. The sample of the study was 135 (87 male and 48 female) high school students with learning disabilities in grades nine through twelve, enrolled in two suburban high schools in suburban California. The students completed a 57-item questionnaire adapted from the Motivated Strategies Learning Questionnaire (MSLQ) and three goal orientation scales.

The results of the study indicated that components of self-regulated learning, sex, and grade level did not predict academic achievement. However, positive relationships were identified among the predictors. High school students with learning disabilities endorsed feelings of self-efficacy, use of varied and complex learning strategies, and a focus on learning for mastery, as well performance in comparison to their peers.

Mehta (2008) at S.N.D.T University, Mumbai sought to study if adequate problem-solving skills could be developed among the learning disabled students by teaching them to use strategies using a single group, pre-test post-test

experimental design. The tools used for the study were: Raven's Progressive Matrices non-verbal test of intelligence, Behavioural Checklist to Screen the Learning Disabled, Diagnostic Test of Learning Disability and a Test of Problem Solving constructed by the researcher. The treatment provided to the subjects selected was a 9-hour strategy training program that spanned over six lessons, one and a half hours each, in groups of six. The strategy used was S-SWEL.

S = State the problem.

S = Search for the possible solutions.

W = Work out a plan.

E = Execute the plan

L = Link it to the problem

At the post-test level, there is an increase of 6.2 in the mean performance of the students. This could be attributed to the effect of the strategy-training program S-SWEL that was given to the subjects. The "t" value of 7.46 indicates a true difference between the obtained score at the pre-test and post-test levels and is not because of chance factors. Also, the correlation value of .40 in the post-test condition is indicative of higher degree of relationship between the post-TPS scores and scholastic achievement as a result of treatment. The results show that the treatment has shown a significant positive effect.

Gandhi & Varma (2009) Delhi University and University of Lucknow, India adapted an instructional approach 'Strategic Content Learning' to promote self-regulated learning skills for problem solving in Mathematics. The indicators of self-regulation were assessed both qualitatively and quantitatively study by carrying out mathematics instruction and intervention in a small-group (5 students in each group) of class VIII. These students were average performers in mathematics. Both boys and girls were drawn from five different typical English medium schools through multistage purposive sampling. The intervention was embedded within a pre-post research design. During the pre- and post-test sessions, same questionnaire, observations, and interventions were employed to measure effects across students and groups. The qualitative inputs were obtained through observations, researcher's field notes, audio tapes and students' math journals; whereas the quantitative data was obtained through questionnaires prepared on metacognition, general self-efficacy and mathematics specific self-efficacy.

One of the most consistent findings across the five groups was a shift in student's knowledge and beliefs related to the process of learning. It was found that students gradually developed a positive shift towards their mathematical knowledge and beliefs. The data as a whole supports improvement in students' awareness of selection, adaptation or invention of personalized task specific strategies.

Klassen (2010) at the Department of Educational Psychology, University of Alberta, Edmonton examined the self-efficacy for self-regulated learning of 146 early adolescents with and without learning disabilities. The participants were early adolescents in grades 8 and 9 at three high schools in Western Canada. The LD group consisted of 73 early adolescents with LD ($M_{\text{age}}=13.89$ years) who received pull out learning support in a resource room one class period out of eight each school day due to identification of a diagnosed learning disability. The 73 NLD (control) participants ($M_{\text{age}}=13.93$ years) were matched for gender and age with the students with LD. There were 25 females and 48 males in each group. The control participants did not receive service for learning difficulties, spoke English as a first language and

were recruited from Social Studies classes. The measures used in the study were 11-item SESRL measure which assesses students' beliefs that they hold the capability to successfully employ self-regulatory strategies. Reading skill was measured using an adaptation of a reading test from the Woodcock-Johnson III Tests of Achievement. Reading self-efficacy was measured using procedures outlined in Bandura's (2006) guide to constructing self-efficacy measures.

Adolescents with LD rated their self-regulatory efficacy and reading self-efficacy lower than their NLD peers. Hierarchical multiple regression showed that self-regulatory efficacy made a significant contribution to end-of-term English grade after controlling for sex, SES, reading self-efficacy, and reading score.

Kadhiravan (2012) at the Department of Psychology, Periyar University, Salem, Tamil Nadu explored the relationship between SRL and academic motivation of adolescents. The study was conducted on 350 higher secondary first group students from 8 schools in Villupuram educational district, Tamil Nadu, selected through stratified random sampling. This study adopted normative survey, which is explorative and associational in nature. The independent variable is achievement motivation and dependent variable is self-regulated learning the data is collected with the help of Self-Regulated Learning Scale (SRLS) by Kadhiravan and Achievement Motivation Scale by Shah Beena. The study sought to study the effects on SRL in relation to gender, type of school they studies and parents' educational level.

The study revealed gender differences in self-regulated learning. Female students showed better usage of self-regulated strategies than male students. It is also concluded that, students differ in their self-regulated learning strategies based on the type of school they have studied. Students from government schools have shown a higher usage of self-regulated learning strategies than the students of private schools. The study also concluded that, students differ in self-regulated learning based on their parents' level of education. Students of literate parents have shown a better usage of self-regulated learning strategies than their counterpart.

Ramganes (2012) at the Department of Educational Technology, Bharathidasan University, Tiruchirappalli studied the effect of self-regulatory strategies with interactive multimedia on problem solving ability of higher secondary students in Physics. The sample comprised of 90 high school students from standard XII of S.R.V.S. National higher secondary school, Karaikal. The experimenter adopted 'Experimental Method' with two parallel groups with pre-test, post-test1 and post-test 2 design. The tools developed and used in the study were: Self-regulatory Awareness Inventory for Physics students (SRAI), Students Attitude Questionnaire in learning Physics (SAQ), Physics Problem Solving Questionnaire (PPSQ). The major findings of the study were:

- Self-regulatory strategy with interactive multimedia was found effective on enhancing the problem solving ability of higher secondary students in Physics as experimental group outperformed control group in the post-tests.
- Self-regulatory strategies with multimedia were found to enhance self-regulatory awareness, student attitude towards learning Physics and knowledge towards Information and Communication Technology (ICT).
- Significant difference was found between post-test1 and post-test 2 of experimental group, the strategies were proved to retain the problem solving ability among the higher secondary students.

METHODOLOGY

The instructions in Self-Regulated Strategies Development (SRSD) model proceeds in a stage-wise manner spanning the below mentioned six stages.

Stage 1: Discuss it

Stage 2: Develop background Knowledge

Stage 3: Model it

Stage 4: Memorise it

Stage 5: Support it

Stage 6: Independent Performance

It must be noted that though these stages are listed in the usual order they are not watertight in nature. They rather provide a general format and guidelines. Throughout the implementation of the six stages irrespective of the type of strategy teachers and students collaborate on the acquisition, implementation, evaluation and modification of self-regulation strategies. Each of the six stages is rather highly flexible and fluid. They offer the ease of being reordered, combined, revisited, modified or even deleted depending on the teacher and student requirements. The stages are also recursive in nature and can always be revisited again.

Table 1: Showing Number of Days and Type of Strategy Training Imparted Corresponding to Each Day

Day	Type of Strategy
1	The Story Grammar (Narrative) Strategy
2	The Question Generation Strategy
3	The Story Map Strategy
4	The Question – Answer Relationship (QAR)Strategy
5	The Summarizing Strategy
6	The SCROL (Expository) Strategy
7	The Question Generation Strategy
8	The Story Map Strategy
9	The Question – Answer Relationship (QAR)Strategy
10	The Summarizing Strategy
11	The WWW, What=2, How= 2 (Writing Strategy)
12	The POW+WWW, What=2, How=2 with Transfer
13	The WWW, What=2, How= 2
14	The POW+WWW, What=2, How=2 with Transfer
15	The POW+WWW, What=2, How=2 with Transfer to class content
16	TREE
17	POW+ TREE
18	TREE
19	POW+TREE with transfer
20	POW+TREE with transfer to class content
21	P- Planning
22	O-Organizing
23	W- Writing
24	E- Editing and Revising
25	E & R Strategy (COPS- Practice Worksheet)
26	E & R Strategy (COPS- Passage Practice)
27	E & R Strategy (SCAN- Practice Worksheet
28	E & R Strategy (SCAN- Passage Worksheet)
29	Self- evaluation, peer editing
30	R - Rewriting

GENERAL DISCUSSIONS

The intervention package comprising of a total of thirty (30) interventions was delivered to students diagnosed with learning disability studying in the Government Schools of the union territory of Chandigarh, as shown in the table above.

The first ten were strategies in reading comprehension. The reading strategies covered both narrative and expository text structures. The strategies covered all the phases of reading; they were arranged and delivered in the three phases namely pre-reading strategies, during-reading and post-reading. Starting with a narrative text, the pre-reading strategy covered was the 'The Story Grammar Strategy'. This was followed by during-reading strategies of 'Question Generation Strategy' and 'The Story Map Strategy'. At the end came the post-reading strategy of 'The Question-Answer Relationship Strategy' and 'Summarizing'. Thereafter, we moved to expository text structure with the same set of strategies with the exception of 'The SCROL Strategy' during pre-reading phase.

The eleventh intervention onwards the interventions shifted towards writing strategies. The first writing strategy covered was the 'WWW, What=2, How=2', followed by the 'POW+WWW, What=2, How=2' with Transfer. The next two interventions once again covered the same two strategies so as to consolidate them but with a new exercise. The fifteenth intervention offered was with respect to the class content of the student concerned. The next interventions offered covered the composition of opinion essays by students. The strategies taught included 'TREE', 'POW+TREE', repetition of techniques with transfer to the students' class content. After having taught the basic writing strategies, we finally moved to the organizational writing strategy called 'POWER'. The E in this strategy stands for Editing and Revising. Under the editing and revising domain we covered two editing strategies namely 'COPS' and 'SCAN'. Each of the two were first introduced on a practice worksheet and later transferred to the passage written by the students. The writing strategies ended with self-evaluation of one's work and the intervention package wrapped up by rewriting one's own written piece after incorporating all revisions and suggestions suggested during peer-editing.

CONCLUSIONS

Self-Regulated Strategy Development (SRSD) is responsive to students, who struggle with learning because; it addresses their multiple cognitive, behavioural, and affective challenges (Harris et al., 2003). The Self-Regulated Strategy and development of competence are endeavours that can give promising results in the long run. The SRSD model can benefit students' with learning disabilities and other struggling learners facing learning issues through explicit teaching with the use of strategies in the classroom.

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